



# A New Way to Address Climate Change: A Global Refunding System

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Addressing climate change is vital. “The Group of Eight leading nations formally endorsed a goal of halving global green-house gas emissions by 2050,” as reported recently in the Wall Street Journal. How can this formal endorsement of a goal be translated into this miracle? The history since Kyoto suggests that the international coordination necessary for a serious effort at slowing climate change is nearly impossible to achieve. Here I present a new idea for a global refunding system that could actually work.

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## THE PROBLEMS WITH KYOTO-STYLE CAP AND TRADE AGREEMENTS

The problems with the Kyoto accord are clear to all. The developing world and the United States did not agree to join in CO<sub>2</sub> emissions reductions and as to the signatories, what will make them achieve their reduction targets?

It is easier either not to join or not to comply and let others do all the work of emissions reduction. That is the fundamental free-rider problem. Greenhouse gases disperse around the globe and burden everyone. One country's reductions burden it alone but benefit everyone. That makes it quite a trick to get largely selfish states to reduce emissions.

The long-term nature of addressing climate change compounds the free-rider problem. Even if a long-term reduction path is chosen at the get-go, each year presents a new opportunity

for each nation to renounce its responsibilities and free-ride on the reductions of others. It is as if the monumental act of coordination (which could not be fully achieved even once at Kyoto) really needs to be reenacted each and every year when countries come to actually implement reductions. Without a way around this problem, any agreement, even if entered with the best of intentions, will soon become a hollow shell.

## A GLOBAL REFUNDING SYSTEM

Imagine that the twenty largest industrial countries would be able to coordinate and agree to put a significant, though not extraordinary, amount of money into a fund, the Global Climate Fund. Then, the countries agree to a constitution by which money will be paid out according to reductions in emissions: the Global Refunding System (GRS). If the system is set up

properly, no further coordination is required, except in administering the system, measuring reductions and distributing money.

We won't need a global policeman to enforce significant reductions. Nations will choose to reduce on their own, and unlike a Kyoto-style cap and trade treaty, they won't have incentives to leave the system.

The rules are simple. Each nation can choose what tax rates to set to reduce its emissions. Tax revenues go into the Global Fund,<sup>1</sup> and each year (or a longer period), refunds are distributed to each nation in proportion to that nation's emission reductions relative to the prior year divided by the sum of all nations' reductions.<sup>2</sup> There could be an initial growth phase, during which only a fraction of tax revenues are redistributed. During this phase, the fund will grow through interest accumulation and because some of the tax revenues will be retained and not refunded.

Eventually, the fund achieves steady state (with large enough initial contributions one might as well go to steady state immediately). In steady state, refunds will equal the sum of revenues and interest from the fund.<sup>3</sup> Nations are free to exit the system anytime (or equivalently

set zero tax rates), but then they will forfeit refunds for that period.

#### BRIEF ASSESSMENT OF THE GLOBAL REFUNDING SYSTEM

The central advantage of the Global Refunding System over a Kyoto-style cap and trade system is that it is self-enforcing. After the initial coordination is achieved (and I discuss how to do that later), nations can freely choose their own tax rates and indeed whether to exit the system entirely.

Moreover, nations have incentives to set much higher tax rates than they would without the system, even potentially optimal tax rates. Why so? Higher emission taxes in a country have the following effects: on the one hand, the member country cannot use the tax revenues directly, as they are collected in the global fund. On the other hand, the country will benefit from higher refunds. A core idea of the proposal is to make the latter effect sufficiently strong. The proportionate reduction formula has the feature that when tax rates are low, a country can actually get a refund of substantially more than its tax collections by raising its taxes and reducing emissions. Overall, in steady state equilibrium,

nations will choose high taxes and refunds will be nearly equal to collections.

In steady state, overall refunds can exceed tax collections by an amount equal to the interest on the fund. The selfish reason for a nation to stay in the system is to capture its share of the interest on the fund. A country loses all its refund claims forever if it exits the system. Hence, a country will continue to participate as long as the wealth of the fund is sufficiently high. And in order to capture a goodly share of the fund's interest income and to keep its own tax, the nation must not only stay in the system, but also substantially reduce emissions each year.

Together with Ralph Winkler, we have formally shown that a refunding system can even be constructed to achieve ideal outcomes that are as good as what could be achieved if all nations were perfectly altruistic and publicly interested.

#### THE DEVELOPING WORLD

Figuring out how to incorporate the developing world in climate-change planning has been difficult. China and India, for example, would not join the Kyoto accord. With the GRS, these nations would not be required to

contribute to the fund. As a result, they would voluntarily join the system—no arm-twisting required—as joining actually entails no obligations but only the possibility of benefits. Initially, they might set tax rates very low or even at zero if emissions are very valuable to these nations, but eventually, as abatement becomes cheaper for them and marginal damages higher, they will abate in order to get a share of the refunds of fund interest.

If the participation of the developing world in immediate reductions is sufficiently valuable to it, this too can be achieved under this system. It only requires larger initial contributions by the developed world. Most studies indicate that the economic and social impacts of climate change are distributed very unevenly across the globe. In particular, there are prospects of severe damage to developing countries in the tropics. Such countries, therefore, will not only have higher marginal damages, they will also lack the funds required for emission abatement. Accordingly, it is justifiable to support developing countries.

The GRS can support developing countries in two ways. First, only rich countries pay an initial fee into the fund, thus increasing future refunds for all countries and benefiting

developing countries. Second, refunding formulas can be designed in such a way that developing countries can benefit.<sup>4</sup>

#### THE FREE-RIDER PROBLEM AND FUNDING THE FUND

The GRS is no panacea. Free-rider problems have no perfect solutions. As in other public-good or cartel settings, each nation would be better off to free-ride. In a sense, rather than eliminate the free-rider problem, the GRS relocates the problem to one time and place—the formation of the fund.

The best possible world for a rich nation asked to contribute initially to the Global Climate Fund would be that the other well-off nations joined, while it declined; the recalcitrant could then enjoy a great climate without paying for it. The worst possible world, though, is that no coordination occurs and the Fund isn't funded.

In order to achieve coordination, the worst world must be the real outcome from that rich nation not joining rather than the best world. In other words, about twenty nations must meet and agree to a treaty that fails if any of them defect. They must be stubborn and believe

that the others will be stubborn and insist on full participation before moving forward. Such a procedure is common in international agreements and has worked before in some cases.

#### CONCLUSION

Getting 20 nations to contribute to the Fund initially and to agree on rules governing its managing body may seem a fantasy, but consider a couple of things. First, the money is not gone, but in a fund they own. Second, consider what could be gained: long-standing self-enforcing incentives to substantially and continuously reduce emissions. And consider the alternative frameworks under consideration. Not only is agreement difficult to obtain, but compliance implicitly entails achieving this feat each and every year. Which is the greater fantasy?

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Letters commenting on this piece or others may be submitted at [submit.cgi?context=ev](http://submit.cgi?context=ev).

#### NOTES

1. Emission taxes are the sole policy instrument a country is allowed to adopt. This is initially a crucial

condition. Later, it may be useful to abolish this requirement.

2. To avoid growth-harming policies, one should adjust or normalize CO<sub>2</sub> emissions by GDP growth. Several refunding formulas are conceivable.
3. That does not say that a stationary level of the fund in real terms is, in general, socially optimal. It is conceivable that increasing or decreasing levels of the fund are optimal at specific times.
4. Developing countries can benefit from the system, e.g., if population weights are used in the refunding formula. A radical proposal would be to finance general support for developing countries by the GRS.

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